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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/494,877	01/31/2000	Zhigang Fang	70239-00086	4072

58688 7590 01/09/2009

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EXAMINER	
MCGUTHRY BANKS, TIMA MICHELE	
ART UNIT	PAPER NUMBER
1793	
MAIL DATE	DELIVERY MODE
01/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/494,877	FANG ET AL.	
	Examiner	Art Unit	
	TIMA M. MCGUTHRY-BANKS	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,7,11-14,19-21,25-27,29,33,34,37 and 41-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,7,11-14,19-21,25-27,29,33,34,37 and 41-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1, 7, 14, 19, 25, 29, 33, 37 and 41-44 are as previously presented, Claims 2-6, 8-10, 15-19, 22-24, 28, 30-32, 35, 36, 38-40 and 45-47 are cancelled, and Claims 11-13, 20, 21, 26, 27 and 34 are as originally filed.

Response to Arguments

Applicant's arguments with respect to the rejection(s) of the claims under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of JP 05-156351 below.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 7, 11, 12, 14 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 05-156301 (from abstract and machine translation) as evidenced by Nakamura et al (US 5,934,542) and in view of JP 10-284547.

JP '301 teaches mixing Super INVAR powder and a ceramic powder in 75:25 to 25:75 mixtures. The mixture is sintered with organic binder (abstract). The ceramic is a carbide [0006]. Regarding Claims 1 and 20, the coefficient of thermal expansion is within the claimed

range, as shown in Table 4 and [0016], i.e. 1.2-6.5 ppm/°C. However, JP '301 does not teach WC as in Claims 1 and 14, the composition of the binder as in Claims 1 and 14, the composition of Super INVAR as it relates to Claims 1, 7, 14 and 19, the difference between the coefficients of thermal expansion as in Claims 11, 12 and 21 and the coefficient of thermal expansion of WC-Co as in Claim 14.

Regarding WC in Claims 1 and 14, JP '301 teaches that the sintered mixture can be used in power machine parts, an electric device and measuring equipment such as IC boards [0001-0002]. JP '457 teaches a contact tool for lead material bonding in IC chip used in semiconductor devices that contain a tool base made of WC dispersed in a phase of Co. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the carbide in JP '301 could include WC, since JP '457 and JP '301 teach using similar materials (carbides) for the same component, i.e. IC equipment.

Regarding the composition of Super INVAR as it relates to Claims 1, 7, 14 and 19, Super INVAR has a composition of 64% Fe, 29% Ni, 17% Co and at most 0.5% C and Mn as evidenced by Nakamura et al (column 17, lines 47-50). Regarding Claims 7 and 19, the composition of Ni is within the claimed range.

Regarding the difference between the coefficients of thermal expansions as in Claims 11, 12 and 21, applicant states on page 6, lines 31 and 32 that the coefficient for thermal expansion for WC is 5.2 ppm/°C. Therefore, the absolute difference between the mixture of JP '301 and that of WC would range from 0-4.0 ppm/°C, which is within the claimed range.

Regarding the thermal expansion of WC-Co, applicant states on page 12, lines 21 and 22 that the coefficient of thermal expansion of WC-Co is 5-6 ppm/°C. Therefore the coefficient of

thermal expansion of the mixture of JP '301 overlaps the range of being less than WC-Co. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. See MPEP § 2144.05.

Claims 13 and 33, 34, 37, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sue et al (US 2006/0222853) in view of JP '301 as evidenced by Nakamura et al and in view of JP '547.

Sue et al teaches a roller cone rock bit comprising three legs with a roller cutter cone mounted on the lower end of each leg. The cutting inserts are provided in the surfaces of the cutter cone [0063]. Sue et al teaches that cemented WC can be used as cutting inserts in roller cone rock bits, where the WC is combined with alloys from the group consisting of Co, Ni, Fe, and others [0009]. Sue et al also teaches a composite construction having a core of WC and Co powder surrounded by a shell of cobalt metal [0032]. The Co powder can be replaced with alloys of Ni and Fe [0009]. However, Sue et al does not teach that the inserts are made with the composition of Claim 1 as in Claim 13 or the composition in Claim 33. JP '301 as evidenced by Nakamura et al and in view of JP '547 is applied as discussed above with respect to the first and second phases in Claim 33, the composition of Ni in Claim 37, the thermal expansion of WC-Co in Claims 41 and 42, and the difference between the coefficients of thermal expansions in Claim 42. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the composition of JP '301 as evidenced by Nakamura et al and in view of JP '547 in the rock bit of Sue et al, since the composition of JP '301 as evidenced by Nakamura et al and in view of JP '547 has a low coefficient of thermal expansion. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on

design incentives or other market forces if the variations are predictable to one of ordinary skill in the art.

Claims 25-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sue et at al in view of JP '301 as evidenced by Nakamura et al and in view of JP '547.

Sue et al teaches a composite construction having a core of WC and Co powder surrounded by a shell of cobalt metal [0032]. The Co powder can be replaced with alloys of Ni and Fe [0009]. However, Sue et al does not teach the second phase of binder alloy as claimed. JP '301 as evidenced by Nakamura et al and in view of JP '547 is applied as discussed above with respect to the first and second phases in Claim 25, the thermal expansion of WC-Co in Claim 26, the coefficient of thermal expansion in Claim 27 and the difference between the coefficients of thermal expansions in Claim 29. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the binder composition as the mixture in JP '301 as evidenced by Nakamura et al and in view of JP '547, since the composition of JP '301 as evidenced by Nakamura et al and in view of JP '547 has a low coefficient of thermal expansion. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art.

Claims 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sue et al in view of JP '301 as evidenced by Nakamura et al and in view of JP '547.

Sue et al teaches a composite construction having a core of WC and Co powder surrounded by a shell of cobalt metal [0032] to form coated fibers. The composite construction has an oriented microstructure and the fibers are bundled together [0008]. The Co powder can be

replaced with alloys of Ni and Fe [0009]. However, Sue et al does not teach the binder alloy as in Claim 43 or the properties as in Claims 43 or 44. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the binder composition as the mixture in JP '301 as evidenced by Nakamura et al and in view of JP '547, since the composition of JP '301 as evidenced by Nakamura et al and in view of JP '547 has a low coefficient of thermal expansion. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMA M. MCGUTHRY-BANKS whose telephone number is (571)272-2744. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

/T. M. M./
Examiner, Art Unit 1793
9 January 2009